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NATIONAL DAM SAFETY PROGRAM, N. J. NO NAME DAM NUMBER 36 (NJ005--ETC(U)
JUL 81 R J MCDERMOTT, J E GRIBBIN DACW61-79-C-0011
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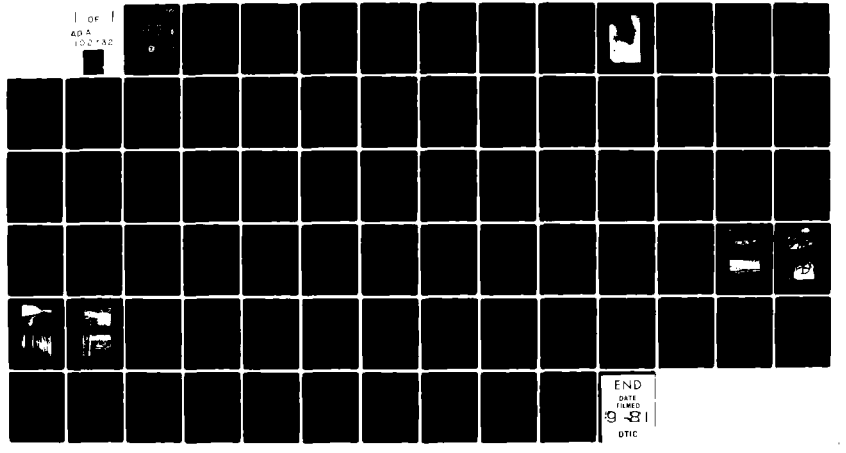

DELAWARE RIVER BASIN
TROUT BROOK, SUSSEX COUNTY
NEW JERSEY

N.J. NO NAME DAM NO. 36

NJ 00532

PHASE 1 INSPECTION REPORT
NATIONAL DAM SAFETY PROGRAM

DEPARTMENT OF THE ARMY
Philadelphia District
Corps of Engineers
Philadelphia, Pennsylvania

JULY 1981

REPT. NO: DAEN/NAP-53842/NJ00532-81/07

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

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18. SUPPLEMENTARY NOTES

Copies are obtainable from National Technical Information Service, Springfield, Virginia 22151.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Dams
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Trout Brook, NJ
National Dam Safety Program
N.J. No Name Dam No. 36, NJ
Sussex County, NJ
Delaware River Basin, NJ
Embankment
Outlet works
Spillways

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report cites results of a technical investigation as to the dam's adequacy. The inspection and evaluation of the dam is as prescribed by the National Dam Inspection Act, Public Law 92-367. The technical investigation includes visual inspection, review of available design and construction records, and preliminary structural and hydraulic and hydrologic calculations, as applicable. An assessment of the dam's general condition is included in the report.

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SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

DEPARTMENT OF THE ARMY
PHILADELPHIA DISTRICT, CORPS OF ENGINEERS
CUSTOM HOUSE—2D & CHESTNUT STREETS
PHILADELPHIA, PENNSYLVANIA 19106

NAPEN-N

27 JUL 1981

Honorable Brendan T. Byrne
Governor of New Jersey
Trenton, New Jersey 08621

Dear Governor Byrne:

Inclosed is the Phase I Inspection Report for N.J. No Name No. 36 Dam in Sussex County, New Jersey which has been prepared under authorization of the Dam Inspection Act, Public Law 92-367. A brief assessment of the dam's condition is given in the front of the report.

Based on visual inspection, available records, calculations and past operational performance, N.J. No Name No. 36 Dam, initially listed as a high hazard potential structure, but reduced to a significant hazard potential structure as a result of this inspection, is judged to be in fair overall condition. The dam's spillways are considered inadequate because a flow equivalent to 30 percent of the One Hundred Year Flood would cause the dam to be overtopped. To ensure adequacy of the structure, the following actions, as a minimum, are recommended:

a. The structural stability of the embankment and the spillways' adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures and studies within six months from the date of approval of this report. Within three months of the consultant's findings remedial measures to ensure structural stability and spillway adequacy should be initiated.

b. Within six months from the date of approval of this report the following remedial actions should be initiated:

(1) The outlet works should be restored to operational adequacy.

(2) Cracked concrete of the spillway headwall should be repaired.

(3) Eroded areas along the upstream face of the dam should be filled and stabilized.

(4) Deteriorated corrugated metal discharge pipe should be repaired or replaced.

(5) Trees and bushes on the embankment should be removed.

c. The owner should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam within one year from the date of approval of this report.

d. An emergency action plan should be developed which outlines actions to be taken by the owner to minimize the downstream effects of an emergency at the dam within six months from the date of approval of this report.

e. Seepage at the dam should be periodically monitored in order to detect any changes in its severity or its effects on the structural stability of the dam.

A copy of the report is being furnished to Mr. Dirk C. Hofman, New Jersey Department of Environmental Protection, the designated State Office contact for this program. Within five days of the date of this letter, a copy will also be sent to Congressman Courter of the Thirteenth District. Under the provision of the Freedom of Information Act, the inspection report will be subject to release by this office, upon request, five days after the date of this letter.

Additional copies of this report may be obtained from the National Technical Information Services (NTIS), Springfield, Virginia 22161 at a reasonable cost. Please allow four to six weeks from the date of this letter for NTIS to have copies of the report available.

An important aspect of the Dam Inspection Program will be the implementation of the recommendations made as a result of the inspection. We accordingly request that we be advised of proposed actions taken by the State to implement our recommendations.

Sincerely,

ROGER L. BALDWIN
Lieutenant Colonel, Corps of Engineers
Commander and District Engineer

1 Incl
As stated

Copies furnished:
Mr. Dirk C. Hofman, P.E., Deputy Director
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

Mr. John O'Dowd, Acting Chief
Bureau of Flood Plain Regulation
Division of Water Resources
N.J. Dept. of Environmental Protection
P.O. Box CN029
Trenton, NJ 08625

N.J. NO NAME NO. 36 DAM (NJ00532)

CORPS OF ENGINEERS ASSESSMENT OF GENERAL CONDITIONS

This dam was inspected on 29 December 1980 by Storch Engineers, under contract to the State of New Jersey. The State, under agreement with the U.S. Army Engineer District, Philadelphia, had this inspection performed in accordance with the National Dam Inspection Act, Public Law 92-367.

N.J. No Name No. 36 Dam, initially listed as a high hazard potential structure, but reduced to a significant hazard potential structure as a result of this inspection, is judged to be in fair overall condition. The dam's spillways are considered inadequate because a flow equivalent to 30 percent of the One Hundred Year Flood would cause the dam to be overtopped. To ensure adequacy of the structure, the following actions, as a minimum, are recommended:

a. The structural stability of the embankment and the spillways' adequacy should be determined by a qualified professional consultant engaged by the owner using more sophisticated methods, procedures and studies within six months from the date of approval of this report. Within three months of the consultant's findings remedial measures to ensure structural stability and spillway adequacy should be initiated.

b. Within six months from the date of approval of this report the following remedial actions should be initiated:

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(4) Deteriorated corrugated metal discharge pipe should be repaired or replaced.

(5) Trees and bushes on the embankment should be removed.

c. The owner should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam within one year from the date of approval of this report.

d. An emergency action plan should be developed which outlines actions to be taken by the owner to minimize the downstream effects of an emergency at the dam within six months from the date of approval of this report.

e. Seepage at the dam should be periodically monitored in order to detect any changes in its severity or its effects on the structural stability of the dam.

APPROVED: Roger L. Baldwin

ROGER L. BALDWIN
Lieutenant Colonel, Corps of Engineers
Commander and District Engineer

DATE: 27 July 81

PHASE I REPORT
NATIONAL DAM SAFETY PROGRAM

Name of Dam:	N.J. No Name No. 36 Dam, I.D. NJ00532
State Located:	New Jersey
County Located:	Sussex
Drainage Basin:	Delaware River
Stream:	Tributary to Trout Brook
Date of Inspection:	December 29, 1980

Assessment of General Condition of Dam

Based on visual inspection, past operational performance and Phase I engineering analyses, N.J. No Name No. 36 Dam is assessed as being in fair overall condition.

Based on investigations of the downstream flood plain made in connection with this report, it is recommended that the hazard potential classification be downgraded from high to significant hazard.

Hydraulic and hydrologic analyses indicate that the spillway is inadequate. Discharge capacity of the spillway is not sufficient to pass the designated spillway design flood (100-year storm) without an overtopping of the dam. The spillway is capable of passing approximately 29 percent of the SDF. Therefore, the owner should engage a professional engineer experienced in the design and construction of dams in the near future to perform more accurate hydraulic and hydrologic analyses relating to the spillway capacity. Based on the findings of the analyses, the need for and type of remedial measures should be determined and then implemented.

The owner should, in the near future, develop an emergency action plan together with an effective warning system outlining actions to be taken by the operator to minimize downstream effects of an emergency at the dam.

The structural stability of the embankment should be investigated in the near future by a professional engineer experienced in the design and construction of dams. Based on the findings of the investigation, the need for and type of remedial measures should be determined and then implemented.

Arrangements should be made in the near future to monitor the seepage on a periodic basis in order to detect any changes in its condition. The monitoring should be performed by a professional engineer experienced in the design and construction of dams.

In addition, it is recommended that the following remedial measures be undertaken by the owner in the near future:

1) The outlet works should be restored to operational adequacy.

2) Cracked concrete of the spillway headwall should be repaired.

3) Eroded areas along the upstream face of the dam should be filled and stabilized.

4) Deteriorated corrugated metal discharge pipes should be repaired or replaced.

5) Trees and bushes on the embankment should be removed.

In the future, the owner of the dam should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam.

Richard J. McDermott, P.E.

John E. Gribbin, P.E.

OVERVIEW - N.J. NO NAME NO. 36 DAM

20 JANUARY 1981

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PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. It is important to note that the condition of dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that the unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydraulic and hydrologic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. The test flood provides a measure of relative spillway capacity and serves as an aid in determining the need for more detailed hydraulic and hydrologic studies, considering the size of the dam, its general condition and the downstream damage potential.

PHASE I INSPECTION REPORT

NATIONAL DAM SAFETY PROGRAM

N.J. NO NAME NO. 36 DAM, I.D. NJ00532

SECTION 1: PROJECT INFORMATION

1.1 General

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a National Program of Dam Inspection throughout the United States. The Division of Water Resources of the New Jersey Department of Environmental Protection (NJDEP) in cooperation with the Philadelphia District of the Corps of Engineers has been assigned the responsibility of supervising the inspection of dams within the State of New Jersey. Storch Engineers has been retained by the NJDEP to inspect and report on a selected group of these dams. The NJDEP is under agreement with the Philadelphia District of the Corps of Engineers.

b. Purpose of Inspection

The visual inspection of N.J. No Name No. 36 Dam was made on December 29, 1980. The purpose of the inspection was to make a general assessment of the structural integrity and operational adequacy of the dam structure and its appurtenances.

1.2 Description of Project

a. Description

The dam consists of an earth embankment with a principal spillway at the right end, emergency spillway at the left end and low level outlet near the center. The principal spillway consists of three 12-inch corrugated metal pipes transversely penetrating the embankment while the emergency spillway consists of a grassed channel adjacent to the end of the embankment.

The outlet works consists of a low level 12-inch corrugated metal pipe with a gate valve located near its discharge end. The outlet discharges directly into Trout Brook which runs along the downstream toe of the dam.

The crest and upstream face of the dam is stabilized by heavy grass cover while the downstream face is overgrown with trees and bushes.

The elevation of the spillway crest is 895.5, National Geodetic Vertical Datum (N.G.V.D.) while that of the crest of dam is 896.7. The elevation of the downstream invert of the outlet works is 873.7 while that of the channel bed is 873.1. The overall length of the dam is 510 feet and its height is 23.0 feet.

b. Location

N.J. No Name No. 36 Dam is located in Stillwater Township, Sussex County, New Jersey. It impounds a recreational lake located on private lands. Principal access to the dam is by a private driveway entered from Fairview Lakes Road. Discharge from the spillway of the dam flows into Trout Brook.

c. Size and Hazard Classification

The dam is classified in accordance with criteria presented in "Recommended Guidelines for Safety Inspection of Dams" published by the U.S. Army Corps of Engineers. Size categories consist of Small, Intermediate and Large while hazard categories are designated as Low, Significant and High.

Size Classification: N.J. No Name No. 36 Dam is classified as "Small" size since its maximum storage volume is 73 acre-feet (which is less than 1000 acre-feet) and its height is 23.0 feet (which is less than 40 feet).

Hazard Classification: Visual inspection of the downstream flood plain of the dam indicates that failure of the dam could cause overtopping of the small dam located approximately 1100 feet from the dam and inundate the Fairview Lakes Road bridge located 1200 feet from the dam. It is not anticipated that dam failure during a storm equivalent to the SDF would cause significant inundation of the two dwellings located approximately 1200 feet from the dam. Loss of more than a few lives is not anticipated. Accordingly, N.J. No Name No. 36 Dam is classified as "Significant" hazard.

d. Ownership

N.J. No Name No. 36 Dam is owned by Mr. M.B. Roessel, Fairview Lakes Road, Newton, New Jersey 07860.

e. Purpose of Dam

The purpose of the dam is the impoundment of a recreational lake.

f. Design and Construction History

Reportedly, N.J. No Name No. 36 Dam was constructed in 1957 at the request of the present owner. Mr. John Crandon reportedly designed and constructed the dam.

g. Normal Operational Procedures

The dam and appurtenances are maintained by the owner. There is no fixed schedule of maintenance; repairs are made as the need arises.

The outlet works is used to drain the lake for lake maintenance purposes, but its gate valve is not presently operable.

Reportedly, the lake has never been lowered since it was constructed in 1957.

1.3 Pertinent Data

a. Drainage Area	0.15 square miles
b. Discharge at Damsite	
Maximum flood at damsite	Unknown
Outlet Works at pool elevation	10 cfs.
Spillway capacity at top of dam	62 cfs
c. Elevation (N.G.V.D.)	
Top of Dam	896.7
Maximum pool-design surcharge	896.9
Recreation pool	895.5
Principal spillway crest	895.5
Emergency spillway crest	895.7
Stream bed at toe of dam	871.7
Maximum tailwater	878 (Estimated)

d. Reservoir

Length of recreation pool	800 feet (Scaled)
Length of maximum pool	900 feet (Estimated)

e. Storage (Acre-feet)

Recreation pool	62
Design surcharge	75
Top of dam	73

f. Reservoir Surface (acres)

Top of dam	9.2 (Estimated)
Maximum pool - design surcharge	9.3 (Estimated)
Recreation pool	8.7

g. Dam

Type	Earthfill
Length	510 feet
Height	23.0 feet
Sideslopes - Upstream	1 horiz. to 1 vert.
- Downstream	1 horiz. to 1 vert.
Zoning	Unknown
Impervious core	Unknown
Cutoff	Unknown
Grout curtain	Unknown

h. Diversion and Regulating Tunnel — N.A.

i. Spillway

Type	(3) 12-inch Corrugated Metal pipes
Length of weir	3 feet

Crest elevation	895.5
Gates	N.A.
Approach channel	N.A.
Discharge channel	Earth swale

j. Emergency Spillway

Type	Grassed Spillway
Length of weir	20 feet
Crest elevation	895.7
Gates	N.A.
Approach channel	N.A.
Discharge channel	Discharge flows overland

k. Regulating Outlet

12" diameter low-level outlet works controlled by gate valve near discharge end.

SECTION 2: ENGINEERING DATA

2.1 Design

No plans or calculations pertaining to the original construction of the dam could be obtained. Reportedly, the dam was designed and constructed by Mr. John Crandon under contract to the owner Mr. M.B. Roessel.

2.2 Construction

No data or reports pertaining to the construction of the dam are available.

2.3 Operation

No data or reports pertaining to operations are available.

2.4 Evaluation

a. Availability

No data or reports pertaining to the operations of the dam are available.

b. Adequacy

Available engineering data pertaining to N.J. No Name No. 36 Dam is not adequate to be of significant assistance to the performance of a Phase I evaluation. A list of absent information is included in paragraph 7.1.b.

c. Validity

The validity of engineering data cannot be assessed due to the absence of data.

SECTION 3: VISUAL INSPECTION

3.1 Findings

a. General

The inspection of N.J. No Name No. 36 Dam was performed on December 29, 1980 by staff members of Storch Engineers. A copy of the visual inspection check list is contained in Appendix 1. The following procedures were employed for the inspection:

1) The embankment of the dam, appurtenant structures and adjacent areas were examined.
2) The embankment and accessible appurtenant structures were measured and key elevations determined by surveyor's level.
3) The embankment, appurtenant structures and adjacent areas were photographed.
4) The downstream flood plain was toured to evaluate downstream development and restricting structures.

b. Dam

The crest of the dam appeared to be generally evenly graded although evidence of vehicle wheel ruts were observed. The crest and upstream face of the dam were grass covered with a few small trees located on the upstream face. There appeared to be some riprap located on the upstream face of the dam, but detailed observation was not possible due to the presence of ice and snow.

The downstream face of the dam was fairly well graded and was overgrown with trees and bushes ranging in size from 2 inches to 12 inches. Many small boulders, 12 inches to 18 inches in diameter, were located on the downstream face of the dam which

appeared to have a slope of 1 horizontal to 1 vertical. At at least two locations, the face was bulged out in relation to adjoining areas of the embankment. One bulge measured approximately 15 feet across and about 10 to 12 feet high. It protruded from the line of the downstream side of the embankment by approximately 2 to 3 feet. At the toe of the bulge, a spot which was wet and contained orange deposits indicating possible seepage was observed. Trout Brook which flows along a portion of the downstream side of the dam, was observed to lie very close to the dam at the point of the bulge.

The right abutment of the dam which is natural earth appeared to be in satisfactory condition. The emergency spillway at the left end of the dam appeared to have been cut into original soil. The downstream side of the dam near the left end appeared to be more irregularly shaped and more thickly overgrown with trees, weeds and briars than the remaining portions.

There was a wet area observed at the toe of dam approximately 70 to 100 feet left of the right end of the dam. The wet area contained orange colored deposits. In addition, a localized wet area containing orange colored deposits was observed at the toe at the location of the embankment bulge.

c. Appurtenant Structures

The invert of the three spillway pipes was approximately 6 inches above the water level at the time of inspection. The headwall was in generally satisfactory condition except that it was cracked at the top of the right hand pipe. The inverts of the three CMP's were deteriorated due to weathering.

A manhole housing the outlet gate is located at the toe of dam about 20 feet from the downstream channel. The operating mechanism for the gate is located inside the manhole but it

was rusty and appeared to have been unused for a considerable period of time. The condition of the 12-inch CMP which discharges directly into the downstream channel appeared to be satisfactory.

d. Description of Reservoir Area

The reservoir is almost entirely wooded with one home site located at the upstream end of the lake. The remainder of the shores slope up from the lake at approximately a 25 to 50 percent grade. The trees are a mixture of pine and hardwood.

e. Downstream Channel

The subject dam is not constructed across Trout Brook but is located adjacent to it. The downstream channel (Trout Brook) consists of a wide shallow meandering natural stream with cobbled bottom and low wooded banks approximately 1 to 2 feet high. A dam which impounds a small lake is located approximately 1100 feet downstream of the dam.

SECTION 4: OPERATIONAL PROCEDURES

4.1 Procedures

The level of water in the impoundment of the subject dam is regulated by discharge through the three (3) 12-inch concrete culvert pipes which comprise the spillway.

Reportedly, the dam has never been drawn down since construction was completed in 1957.

4.2 Maintenance of the Dam

Reportedly, maintenance on the dam is performed on an "as needed" basis.

4.3 Maintenance of Operating Facilities

Reportedly, regular maintenance of operating facilities consists of cleaning the spillway culvert pipes and the trimming and cutting of trees and brush located on the crest and upstream face of the dam.

4.4. Description of Warning System

Reportedly no warning system is currently in use for the dam.

4.5 Evaluation of Operational Adequacy

The operation of the dam has been successful to the extent that the dam reportedly has not been overtopped.

Maintenance documentation is poor and the maintenance program for the dam has not been adequate in the following areas:

1) Outlet works facilities not maintained in functioning condition.
2) Cracked concrete on the spillway headwall not repaired.
3) Eroded areas along the upstream face of dam not properly stabilized.
4) Deteriorated corrugated metal pipe in spillway not repaired.
5) Trees and bushes on the downstream face of the embankment not removed.

SECTION 5: HYDRAULIC/HYDROLOGIC

5.1 Evaluation of Features

a. Design Data

The quantity of storm water runoff that the spillway should be able to handle is based on the size and hazard classification of the dam. This runoff quantity, called the spillway design flood (SDF) is described in terms of return frequency or probable maximum flood (PMF) depending on the extent of the dam's size and potential hazard. According to the "Recommended Guidelines for Safety Inspection of Dams" published by the U.S. Army Corps of Engineers, the SDF for N.J. No Name #36 Dam falls in a range of 100-year frequency to 1/2 PMF. In this case, the low end of the range, 100-year frequency, is chosen since the factors used to select size and hazard classification are on the low side of their respective ranges.

The SDF peak computed for N.J. No Name No. 36 Dam is 226 c.f.s. This value is derived from the 100-year flood hydrograph computed by the use of the HEC-1-DAM Flood Hydrograph Computer Program using the Soil Conservation Service unit hydrograph with curvilinear transformation. Hydrologic computations and computer output are contained in Appendix 4.

The spillway discharge rates were computed by the use of culvert capacity charts assuming inlet control. The total spillway discharge with lake level equal to the top of the dam was computed to be 62 c.f.s. The SDF was routed through the dam by use of the HEC-1-DAM computer program using the modified Puls Method. In routing the SDF, it was found that the dam crest would be overtopped by a depth of 0.2 feet. Accordingly, the subject spillway is assessed as being inadequate in accordance with criteria developed by the U.S. Army Corps of Engineers.

b. Experience Data

Reportedly, the dam has not been overtopped since its construction in 1957.

c. Visual Observation

No evidence was found at the time of inspection that would indicate that the dam had been overtopped.

d. Overtopping Potential

As indicated in paragraph 5.1.a., a storm of magnitude equal to the SDF would cause overtopping of the dam by a depth of 0.2 foot over the crest of the dam. The spillway is capable of passing approximately 29 percent of the SDF with the lake level equal to the top of dam.

e. Drawdown Time

Drawdown of the lake is accomplished by opening the gate in the low level 12-inch CMP. Total time for drawdown is estimated to be 4.5 days. (See Appendix 4.)

SECTION 6: STRUCTURAL STABILITY

6.1 Evaluation of Structural Stability

a. Visual Observations

The dam appeared, at the time of inspection to be generally outwardly stable. Evidence of possible seepage was observed at two locations including one of two bulged areas of the downstream side of embankment. Also, the downstream slope of embankment appeared excessively steep. The effect of the bulged embankment face and seepage on the stability of the dam could not be assessed.

b. Generalized Soils Description

The generalized soils description for the dam site consists of recent alluvium composed of stratified materials deposited by streams overlying silt containing shale fragments. Bedrock is shallow and consists of slate and shale of Ordovician age shown as Martinsburg shale on the Geologic Map of New Jersey.

c. Design and Construction Data

Analysis of structural stability and construction data for the embankment are not available.

d. Operating Records

No operating records are available for the dam. The water level of the impoundment is not monitored.

e. Post-Construction Changes

Reportedly, there has not been any post-construction changes. No evidence of significant post-construction changes was noted at the time of inspection.

f. Seismic Stability

N.J. No Name No. 36 Dam is located in Seismic Zone 1 as defined in "Recommended Guidelines for Safety Inspection of Dams" which is a zone of very low seismic activity. Experience indicates that dams in Seismic Zone 1 will have adequate stability under seismic loading conditions if they have adequate stability under static loading conditions. N.J. No Name No. 36 Dam appeared to be generally stable under static loading conditions at the time of inspection.

SECTION 7: ASSESSMENT AND RECOMMENDATIONS

7.1 Dam Assessment

a. Safety

Based on hydraulic and hydrologic analyses outlined in Section 5 and Appendix 4, the spillway of N.J. No Name No. 36 Dam is assessed as being inadequate. The spillway is not able to pass the SDF without an overtopping of the dam.

The embankment appeared, at the time of inspection, to be generally outwardly stable. Observed seepage and bulging in the embankment are not considered to be evidence of immediate dam instability.

b. Adequacy of Information

Information sources for this report include 1) field inspections, 2) USGS quadrangle, and 3) consultation with the owner of the dam. The information obtained is sufficient to allow a Phase I assessment as outlined in "Recommended Guidelines for Safety Inspection of Dams."

Some of the absent data are as follows:

1. Construction and as-built drawings.
2. Description of fill material for embankment.
3. Design computations and reports.
4. Soils report for the site.
5. Maintenance documentation

c. Necessity for Additional Data/Evaluation

Additional data and evaluation is considered necessary to assess the structural stability of the embankment.

7.2 Recommendations

a. Remedial Measures

Based on hydraulic and hydrologic analyses outlined in paragraph 5.1.a, the spillway is considered to be inadequate. It is therefore recommended that a professional engineer experienced in the design and construction of dams be engaged in the near future to perform more accurate hydraulic and hydrologic analyses relating to spillway capacity. Based on the findings of the analyses, the need for and type of remedial measures should be determined and then implemented.

The owner should, in the near future, develop an emergency action plan together with an effective warning system outlining actions to be taken by the operator to minimize downstream effects of an emergency at the dam.

In addition, it is recommended that the following remedial measures be undertaken by the owner in the near future:

1) The outlet works should be restored to operational adequacy.

2) Cracked concrete of the spillway headwall should be repaired.

3) Eroded areas along the upstream face of the dam should be filled and stabilized.

4) Deteriorated corrugated metal discharge pipe should be repaired or replaced.

5) Trees and bushes on the embankment should be removed.

b. Maintenance

In the future, the owner of the dam should develop written operating procedures and a periodic maintenance plan to ensure the safety of the dam.

c. Additional Studies

The structural stability of the embankment should be investigated in the near future by a professional engineer experienced in the design and construction of dams. Based on the findings of the investigation, the need for and type of remedial measures should be determined and then implemented.

In addition, the observed seepage should be monitored on a periodic basis by a professional engineer experienced in the design and construction of dams in order to detect any changes in its condition.

PLATES

N.J. No Name No. 36 DAM

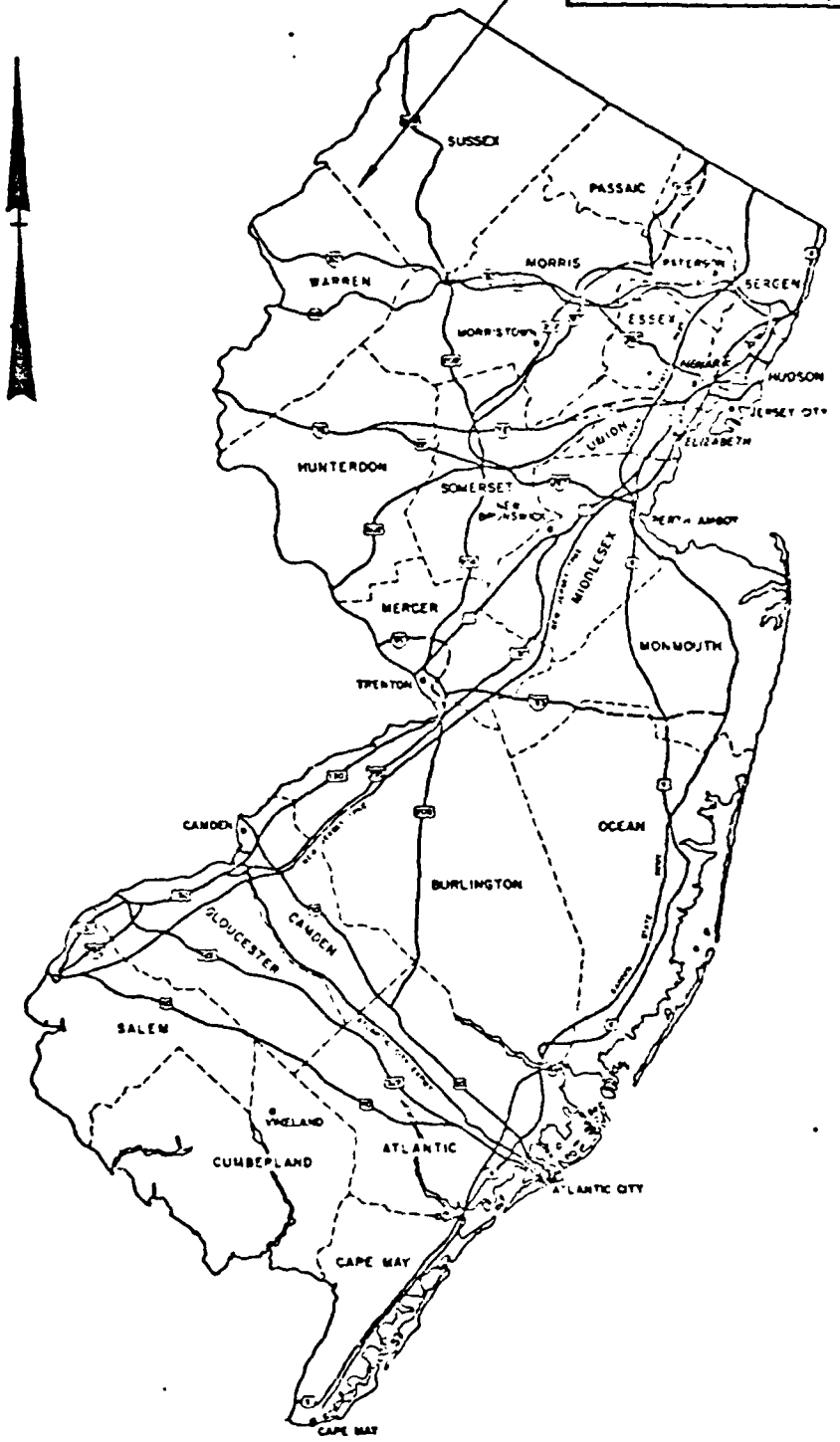


PLATE 1

STORCH ENGINEERS FLORHAM PARK, NEW JERSEY	INSPECTION AND EVALUATION OF DAMS KEY MAP N.J. No Name No. 36 DAM
DIVISION OF WATER RESOURCES N.J. DEPT. OF ENVIR. PROTECTION TRENTON, NEW JERSEY	SCALE: NONE DATE: FEB. 1981

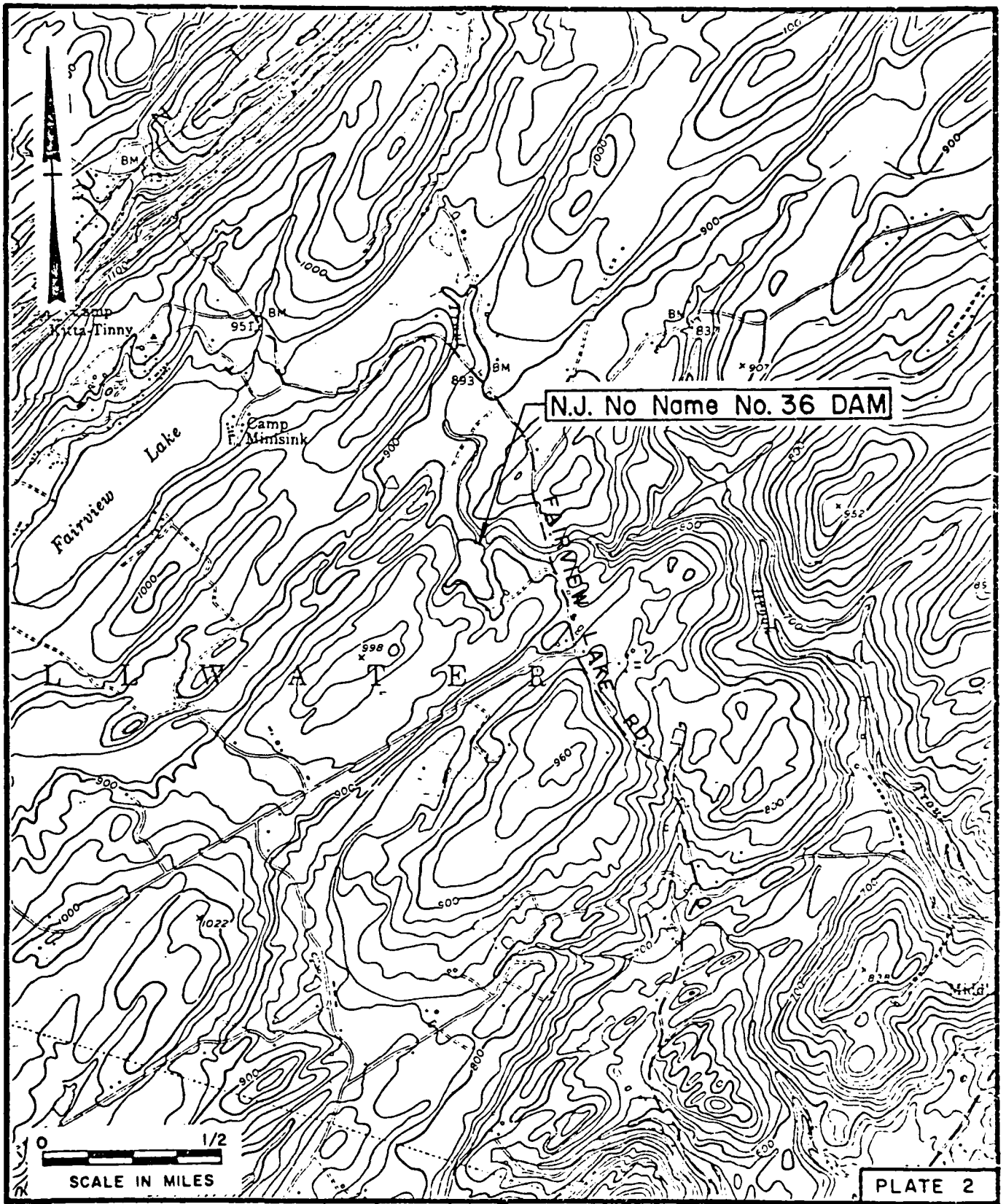


PLATE 2

STORCH ENGINEERS
FLORHAM PARK, NEW JERSEY

DIVISION OF WATER RESOURCES
N.J. DEPT. OF ENVIR. PROTECTION
TRENTON, NEW JERSEY

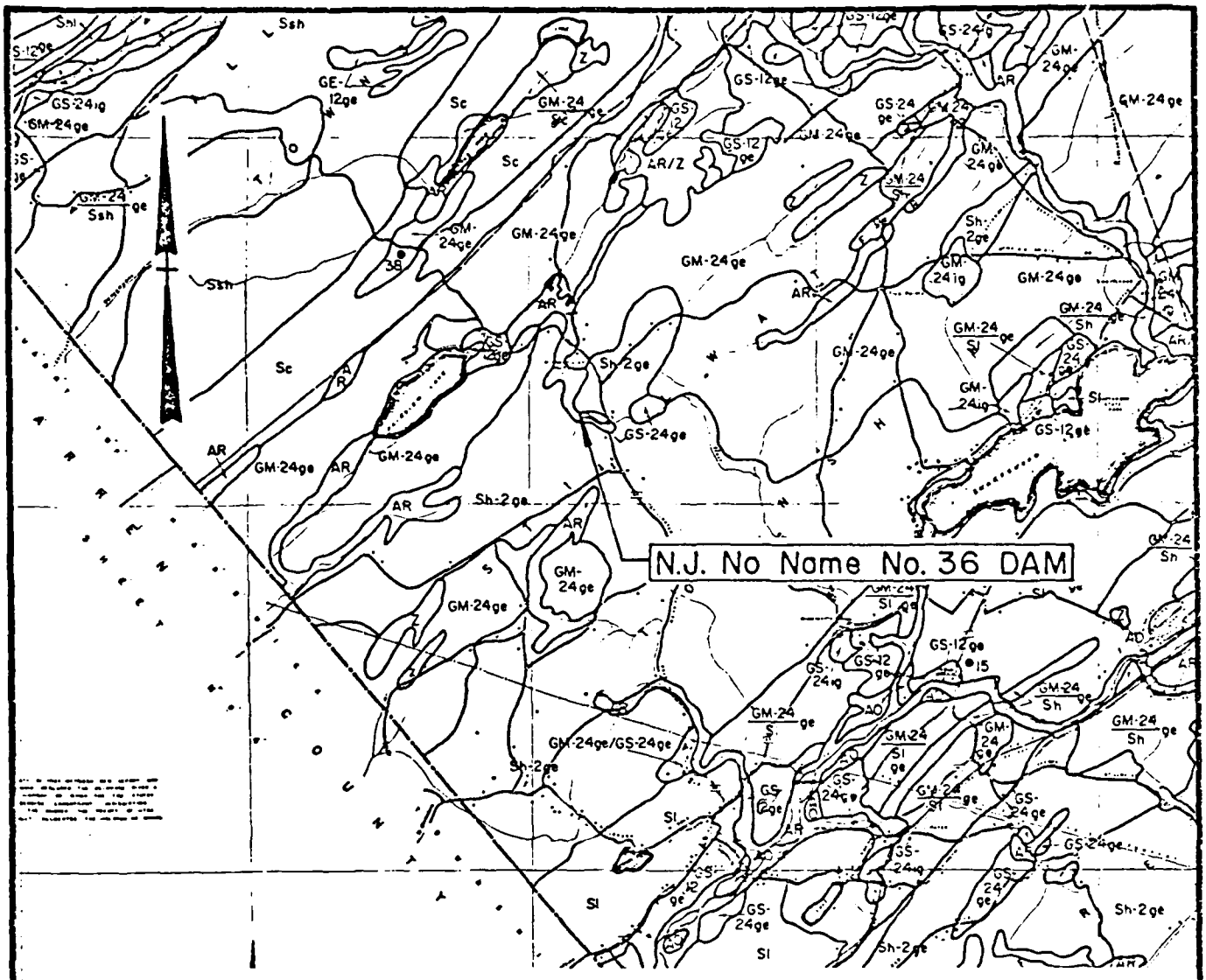
INSPECTION AND EVALUATION OF DAMS

VICINITY MAP

N.J. No Name No. 36 DAM

SCALE: AS SHOWN

DATE: FEB. 1981



Legend

AR — Recent alluvium composed of stratified ma deposited by stream.

Sh-2 — Slate and shale bedrock of Ordovician age. as the Martinsgurg shale on the Geologic Map of New Jersey (ordovician age formation)

Note: Information taken from Rutgers University, Soil Survey of New Jersey, Report No. 11, Sussex County, November 1953 and Geologic Map of New Jersey prepared by J.V. Lewis and H. Kummel 1910-1912, revised by H. B. Kummel 1931 and M. Johnson 1950.

PLATE 3

STORCH ENGINEERS
FLORHAM PARK, NEW JERSEY.

DIVISION OF WATER RESOURCES
N.J. DEPT. OF ENVIR. PROTECTION
TRENTON, NEW JERSEY.

INSPECTION AND EVALUATION OF DAMS

SOIL MAP

N.J. No Name No. 36 DAM

SCALE: NONE

DATE: FEB.1981

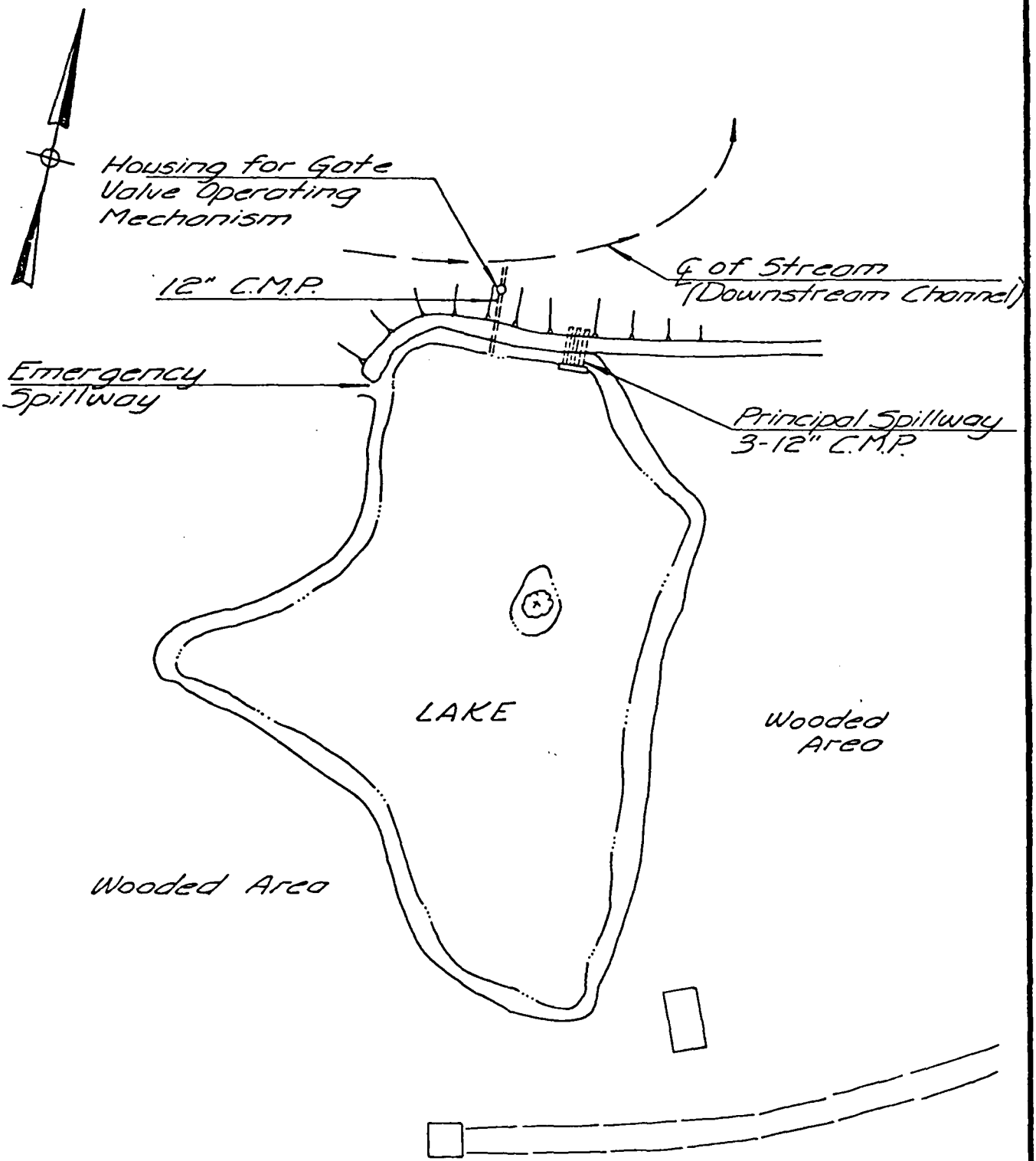
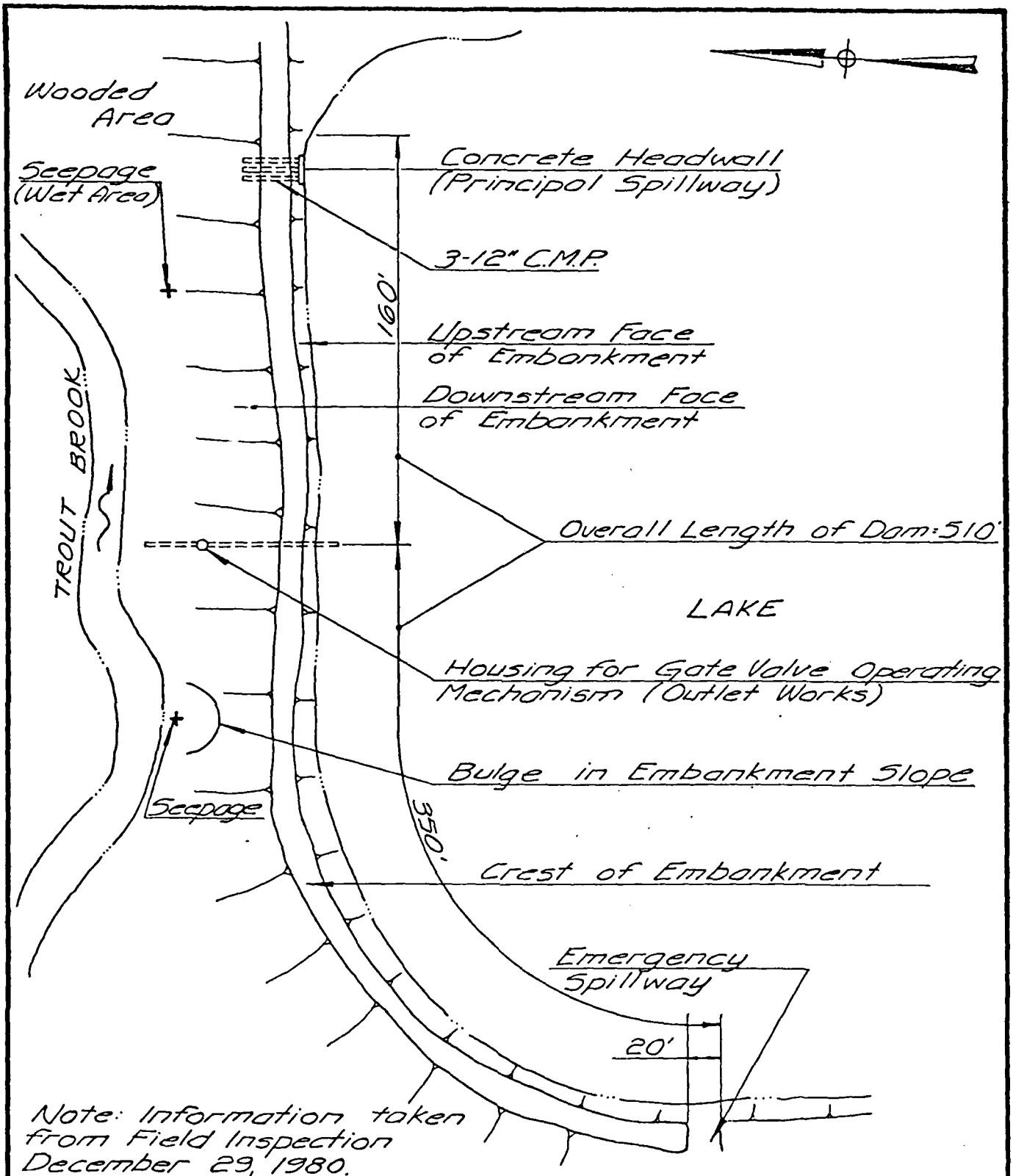


PLATE 4

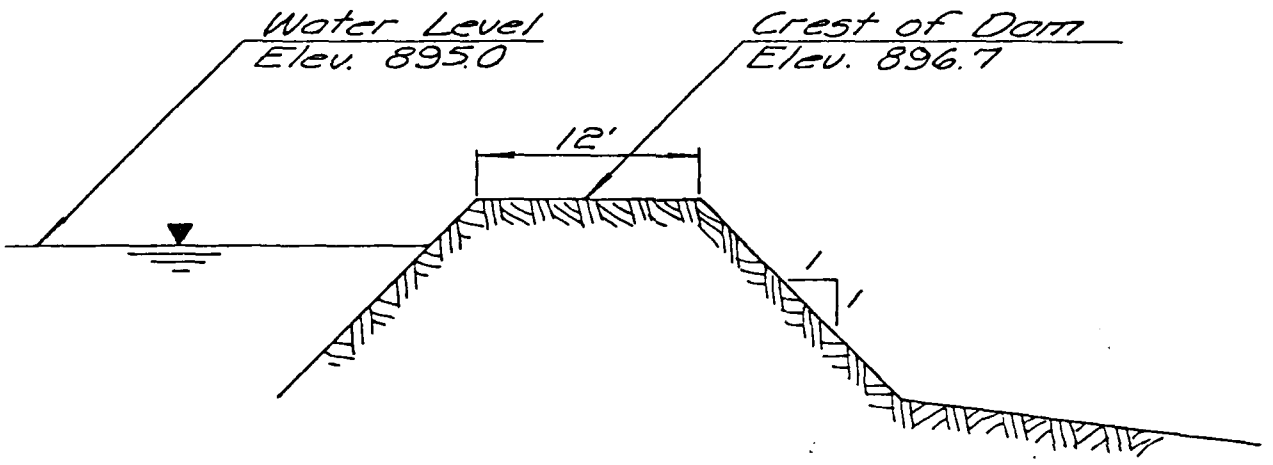
STORCH ENGINEERS FLORHAM PARK, NEW JERSEY	INSPECTION AND EVALUATION OF DAMS OVERVIEW N.J. NO. NAME No. 36 DAM
DIVISION OF WATER RESOURCES N.J. DEPT. OF ENVIR. PROTECTION TRENTON, NEW JERSEY	N.J. I.D. 00532 / SCALE: NONE DATE: APRIL, 1981



Note: Information taken from Field Inspection December 29, 1980.

PLATE 5

STORCH ENGINEERS FLORHAM PARK, NEW JERSEY	INSPECTION AND EVALUATION OF DAMS GENERAL PLAN N.J. NO. NAME No. 36 DAM
DIVISION OF WATER RESOURCES N.J. DEPT. OF ENVIR. PROTECTION TRENTON, NEW JERSEY	N.J. I.D. 00532 / SCALE: NONE DATE: APRIL, 1981



TYPICAL DAM SECTION

PLATE 6

STORCH ENGINEERS FLORHAM PARK, NEW JERSEY	INSPECTION AND EVALUATION OF DAMS SECTION N.J. NO NAME No. 36 DAM
DIVISION OF WATER RESOURCES N.J. DEPT. OF ENVIR. PROTECTION TRENTON, NEW JERSEY	N.J. I.D. 00532 — SCALE: NONE DATE: APRIL, 1981

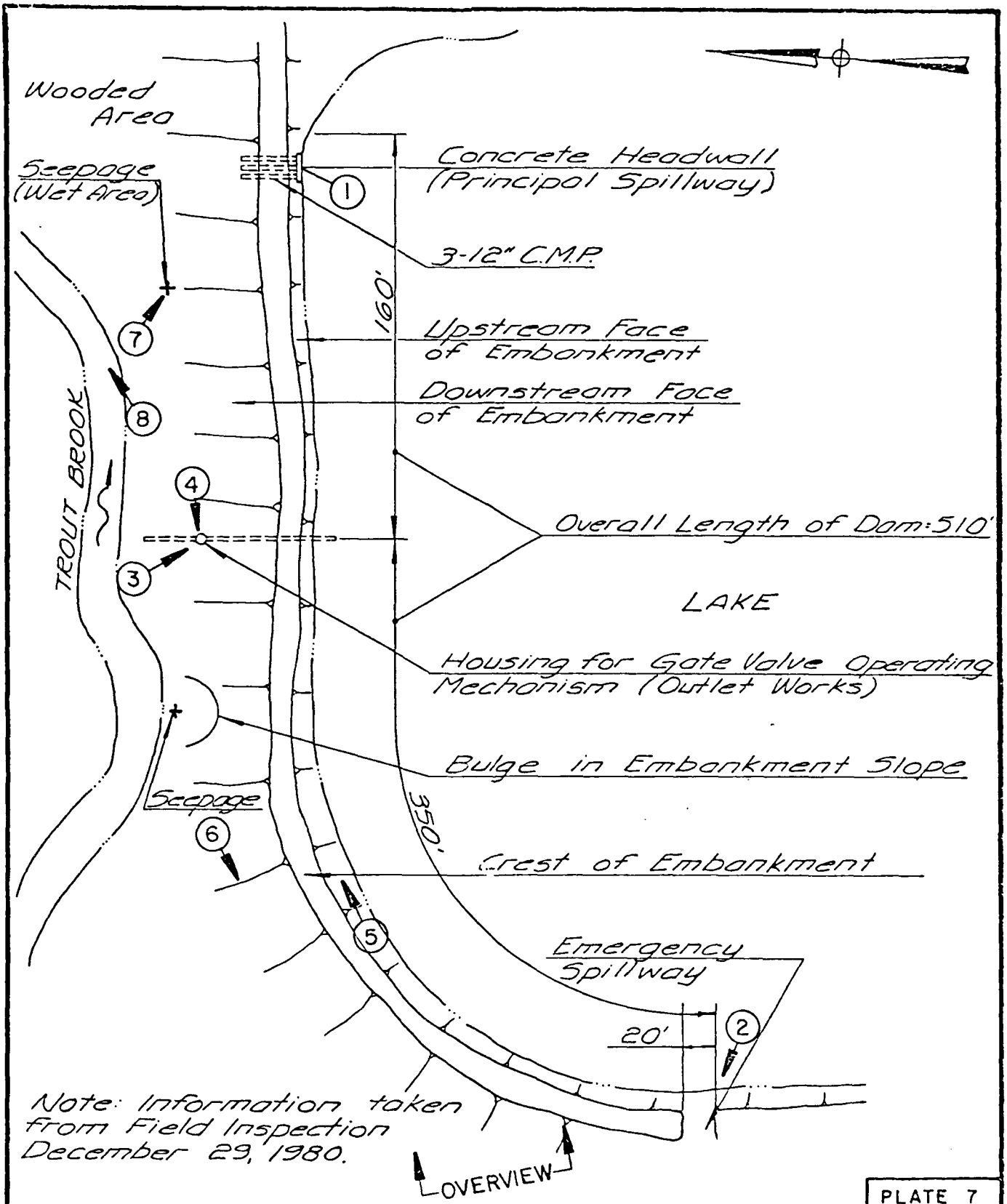


PLATE 7

STORCH ENGINEERS
FLORHAM PARK, NEW JERSEY

DIVISION OF WATER RESOURCES
N.J. DEPT. OF ENVIR. PROTECTION
TRENTON, NEW JERSEY

INSPECTION AND EVALUATION OF DAMS

PHOTO LOCATION PLAN

N.J. NO. NAME No. 36 DAM

N.J. I.D. 00532

SCALE: NONE

DATE: APRIL, 1981

APPENDIX 1

Check List - Visual Inspection

Check List - Engineering Data

Check List

Visual Inspection

Phase I

Name of Dam N.J. No Name #36 County Sussex State N.J. Coordinators NJDEP

Date(s) Inspection 12/29/81 Weather Partly Cloudy Temperature 35°F.

Pool Elevation at time of Inspection 895.5 M.S.L. Tailwater at Time of Inspection 875.1 M.S.L.

Inspection Personnel:

John Gribbin Mark Brady

Charles Osterkorn Richard McDermott

Daniel Buckelew

John Gribbin Recorder

Owners Representative not present

EMBANKMENT

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
GENERAL	Automobile ruts on crest. Crest and upstream face covered by thick stand of grass. Downstream face overgrown by briars and trees (2" to 12"). Also, boulders observed on downstream face.	Trees should be removed.
JUNCTION OF EMBANKMENT AND ABUTMENT, SPILLWAY AND DAM	Junctions appeared stable.	
ANY NOTICEABLE SEEPAGE	Seepage observed in two locations: 1. Wet point at toe of dam at location of bulge in embankment. Orange colored deposits observed in wet point. 2. Wet swampy area observed at toe of dam about 80 feet from right end of dam. Orange colored deposits observed in portion of wet area.	Seepage should be monitored.
STAFF GAGE AND RECORDER	None observed.	
DRAINS	None observed.	

EMBANKMENT

VISUAL EXAMINATION	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SURFACE CRACKS	None observed.	
UNUSUAL MOVEMENT OR CRACKING AT OR BEYOND THE TOE	Bulge observed on downstream side of dam where downstream channel meets toe of dam. Bulge approx. 15' wide, 10' high and protrudes from surface approx. 2' to 3'. Also, smaller bulged area of embankment at toe observed approx. 150' left of outlet works.	Bulges could be indication of embankment distress and should be investigated.
SLOUGHING OR EROSION OF EMBANKMENT AND ABUTMENT SLOPES	Some erosion of upstream face of embankment observed.	Eroded areas of upstream side of dam should be repaired.
VERTICAL AND HORIZONTAL ALIGNMENT OF THE CREST	Vertical: generally level. Horizontal: curved.	
RIPRAP	Some riprap observed on the upstream face of the dam. Top of riprap about 2' below crest of embankment.	

OUTLET WORKS

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONCRETE SURFACES IN OUTLET CONDUIT	12-inch corrugated metal pipe generally could not be observed. Discharge end protruding into downstream channel. Condition of outlet conduit appears to be satisfactory.	
INTAKE STRUCTURE	Not observed.	
OUTLET STRUCTURE	N/A	
OUTLET CHANNEL	Outlet works discharge directly into downstream channel.	
GATE AND GATE HOUSING	Manhole located near the center of the dam at the embankment toe. Condition of manhole satisfactory, but manhole contained debris. Manhole cover easily removable. Gate operating mechanism within manhole appeared rusted and inoperable.	Debris should be removed. Operating mechanism should be investigated for operational adequacy.

SPILLWAY

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONC. CULVERTS	The three (3) 12-inch CMP's were rusted severely.	Discharge culverts should be repaired or replaced.
HEADWALL	Concrete headwall appeared to be in generally satisfactory condition with crack at one culvert.	Crack in headwall should be repaired.
DISCHARGE CHANNEL	Culverts protrude from the downstream face of the embankment - no headwall, apron, or other stabilization observed. Discharge channel consisted of earth channel formed adjacent to downstream side of dam.	
EMERGENCY SPILLWAY	No distinct channel downstream of grassed emergency spillway observed. Emergency spillway appeared to be formed in original ground adjacent to left end of dam.	

INSTRUMENTATION

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
MONUMENTATION/SURVEYS	None	
OBSERVATION WELLS	None	
WEIRS	None	
PIEZOMETERS	None	
OTHER		

DOWNSTREAM CHANNEL

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
CONDITION (OBSTRUCTION, DEBRIS, ETC.)	Downstream channel flows approx. parallel to dam about 20' from toe. Spillway discharges into downstream channel by discharge channel. Downstream channel consists of wide natural stream with cobble-lined bed.	Dam is off-stream.
SLOPES	Banks approx. 2' high with moderate to steep wooded terrain beyond the banks.	
STRUCTURES ALONG BANKS	Small dam located 1100 feet downstream of dam. Two dwellings and road bridge located 1200 feet downstream of dam. Dwellings 6 feet above streambed.	

RESERVOIR

VISUAL EXAMINATION OF	OBSERVATIONS	REMARKS OR RECOMMENDATIONS
SLOPES	The shores almost entirely wooded. Slopes generally steep, approx. 25% to 50%.	
SEDIMENTATION	Unknown	
STRUCTURES ALONG BANKS	One homesite located at upstream end of reservoir.	

CHECK LIST
ENGINEERING DATA
DESIGN, CONSTRUCTION, OPERATION

ITEM			REMARKS
DAM	-	PLAN	Not Available
		SECTIONS	
SPILLWAY	-	PLAN	Not Available
		SECTIONS	
		DETAILS	
OPERATING EQUIPMENT PLANS & DETAILS			Not Available
OUTLETS	-	PLAN	Not Available
		DETAILS	
		CONSTRAINTS	
		DISCHARGE RATINGS	
HYDRAULIC/HYDROLOGIC DATA			Not Available
RAINFALL/RESERVOIR RECORDS			Not Available
CONSTRUCTION HISTORY			Not Available
LOCATION MAP			Not Available

ITEM	REMARKS
DESIGN REPORTS	Not Available
GEOLOGY REPORTS	Not Available
DESIGN COMPUTATIONS HYDROLOGY & HYDRAULICS DAM INSTABILITY SEEPAGE STUDIES	Not Available
MATERIALS INVESTIGATIONS BORING RECORDS LABORATORY FIELD	Not Available
POST-CONSTRUCTION SURVEYS OF DAM	Not Available
BORROW SOURCES	Not Available

ITEM	REMARKS
MONITORING SYSTEMS	Not Available
MODIFICATIONS	Not Available
HIGH POOL RECORDS	Not Available
POST CONSTRUCTION ENGINEERING STUDIES AND REPORTS	Not Available
PRIOR ACCIDENTS OR FAILURE OF DAM DESCRIPTION REPORTS	Not Available
MAINTENANCE OPERATION RECORDS	Not Avialable

APPENDIX 2

Photographs

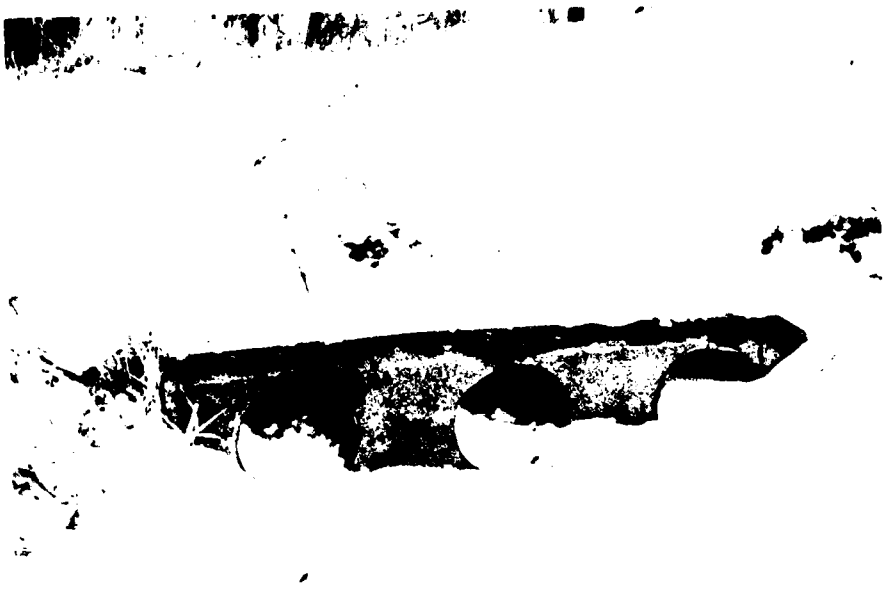


PHOTO 1
INTAKE END OF SPILLWAY

PHOTO 2
UPSTREAM VIEW OF EMERGENCY SPILLWAY

N.J. NO NAME NO. 36 DAM
29 DECEMBER 1980

PHOTO 3

GATE HOUSING AND DISCHARGE END OF LOW LEVEL OUTLET

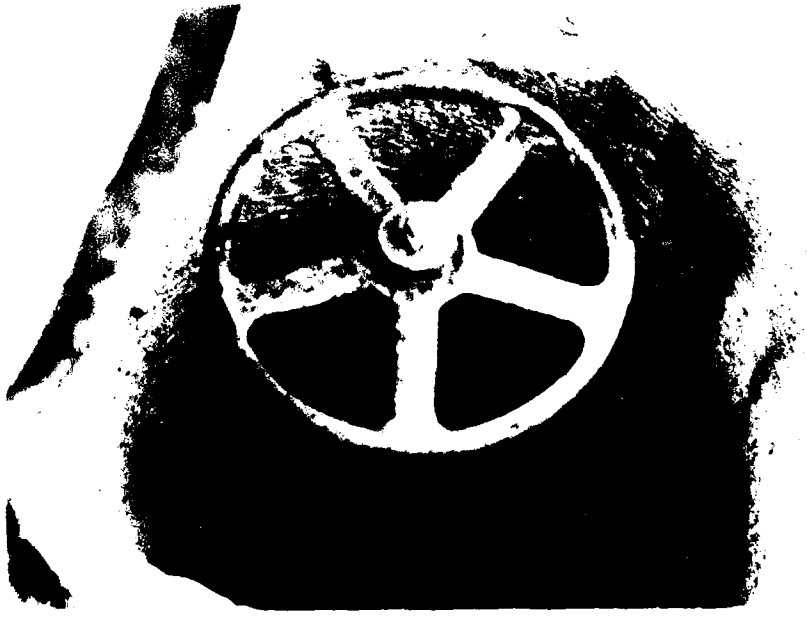


PHOTO 4

GATE OPERATING MECHANISM

PHOTO 5
UPSTREAM FACE AND CREST OF EMBANKMENT

PHOTO 6
DOWNSTREAM FACE OF EMBANKMENT

N.J. NO NAME NO. 36 DAM
29 DECEMBER 1980

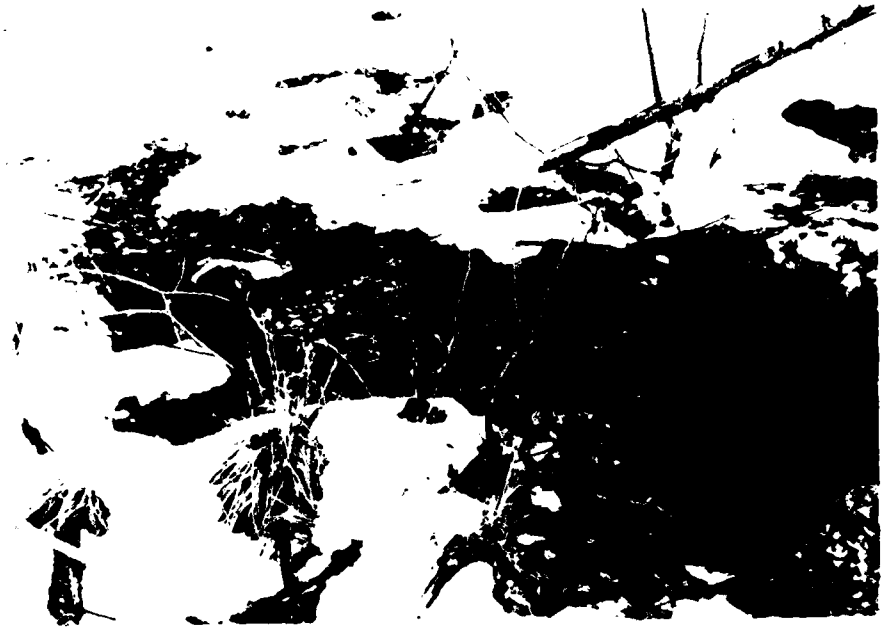


PHOTO 7
SEEPAGE AT TOE OF DAM

PHOTO 8
DOWNSTREAM CHANNEL

N.J. NO NAME NO. 36 DAM
29 DECEMBER 1980

APPENDIX 3

Engineering Data

CHECK LIST

HYDROLOGIC AND HYDRAULIC DATA

ENGINEERING DATA

DRAINAGE AREA CHARACTERISTICS: Wooded D.A.=0.15 sq. mi

ELEVATION TOP NORMAL POOL (STORAGE CAPACITY): 895.5 (62 acre-feet)

ELEVATION TOP FLOOD CONTROL POOL (STORAGE CAPACITY): N.A.

ELEVATION MAXIMUM DESIGN POOL: 896.9

ELEVATION TOP DAM: 896.7

PRINCIPAL SPILLWAY CREST:

a. Elevation 895.5

b. Type Three 12-inch CMP

c. Width N.A.

d. Length 3 ft.

e. Location Spillover Downstream side of dam

f. Number and Type of Gates None

AUXILIARY SPILLWAY CREST:

a. Elevation 895.7

b. Type Grassed channel

c. Width N.A.

d. Length 20 ft.

e. Location Spillover Adjacent to left end of dam

f. Number and Type of Gates None

OUTLET WORKS:

a. Type Gated 12-inch CMP

b. Location Approx. center of dam

c. Entrance Invert Unknown

d. Exit Invert 873.7

e. Emergency Draindown Facilities: Open gate

HYDOMETEOROLOGICAL GAGES: None

a. Type N.A.

b. Location N.A.

c. Records N.A.

MAXIMUM NON-DAMAGING DISCHARGE:

(Lake Stage Equal to Top of Dam) 62 c.f.s.

APPENDIX 4

Hydraulic/Hydrologic Computations

STORCH ENGINEERS

Sheet 1 of 11

Project LAKE N.J. NoName #36 DAM Made By JiHa Date 3-11-81

Chkd By JG Date 4/10/81

HYDROLOGIC ANALYSIS

INFLOW HYDROGRAPH FOR LAKE NoName #36 WILL BE DEVELOPED BY HEC-1-DAM, USING SCS TRIANGULAR UNIT HYDROGRAPH AND ROUTED BY THE MODIFIED PULS METHOD

DRAINAGE AREA = 0.15 SQMI

INFILTRATION DATA

DRAINAGE AREA IS MAINLY WOODED

USE : INITIAL INFILTRATION 1.5 IN

CONSTANT INFILTRATION 0.15 IN/HR

STORCH ENGINEERS

Sheet 2 of 11

Project LAKE N.J. NoName #36 DAM Made By JiHa Date 3-11-81

Chkd By JG Date 4/10/81

TIME OF CONCENTRATION:

[by SCS - TR - 55]

OVERLAND FLOW : length [Ft] 2600

slope [%] 4.0

velocity [Ft/s] 0.5

$Tc = \left[\frac{2600}{0.5}\right]\frac{1}{3600} = 1.44$ Hr

TIME OF CONCENTRATION:

[by Handbook of applied hydrology
Chow - Pg 14-36]

$$Tc^{2.14} = \frac{2}{3}\frac{Ln}{\sqrt{S}}$$

$$Tc^{2.14} = \frac{2}{3}\frac{2600 \times 0.4}{\sqrt{0.04}}$$

$Tc = 45$ min

$Tc = 0.75$ Hr

Tc = time of concentr. [Min]

S = slope of overland flow [%]

η = 0.4 roughness coefficient

L = length of overland flow [Ft]

TIME OF CONCENTRATION:

[Design of small dams]
Pg 70

$$T_c = \left[\frac{11.9 L^3}{H}\right]^{0.385}$$

$$T_c = \left[\frac{(11.9 \times 0.492)^3}{105}\right]^{0.385}$$

T_c = time of concentr. [Hr]

L = length of longest watercourse [Mi]

H = elevation diffrence [Ft]

$T_c = 0.19$ Hr

COMPUTER INPUT.

FOR HEC-1-DAM INPUT USE

$T_c = 1.0$ Hr LAG = 60% T_c

LAG TIME = 0.60 Hr.

24 HOURS, 100 YEAR RAINSTORM DISTRIBUTION

FOR LAKE N.J. No Name # 36 DAM

TIME [Hr]	RAIN [IN]
1	0.08
2	0.08
3	0.08
4	0.08
5	0.08
6	0.08
7	0.09
8	0.09
9	0.18
10	0.18
11	0.18
12	0.19
13	0.3
14	0.3
15	0.8
16	3.0
17	0.4
18	0.3
19	0.19
20	0.18
21	0.09
22	0.09
23	0.08
24	0.08
24 Hr	Σ 7.20

FROM TP 40 U.S. WEATHER BUREAU

Project LAKE N.J. No Name #36 DAM Made By JiHo Date 3-11-81

Chkd By JG Date 4/10/81

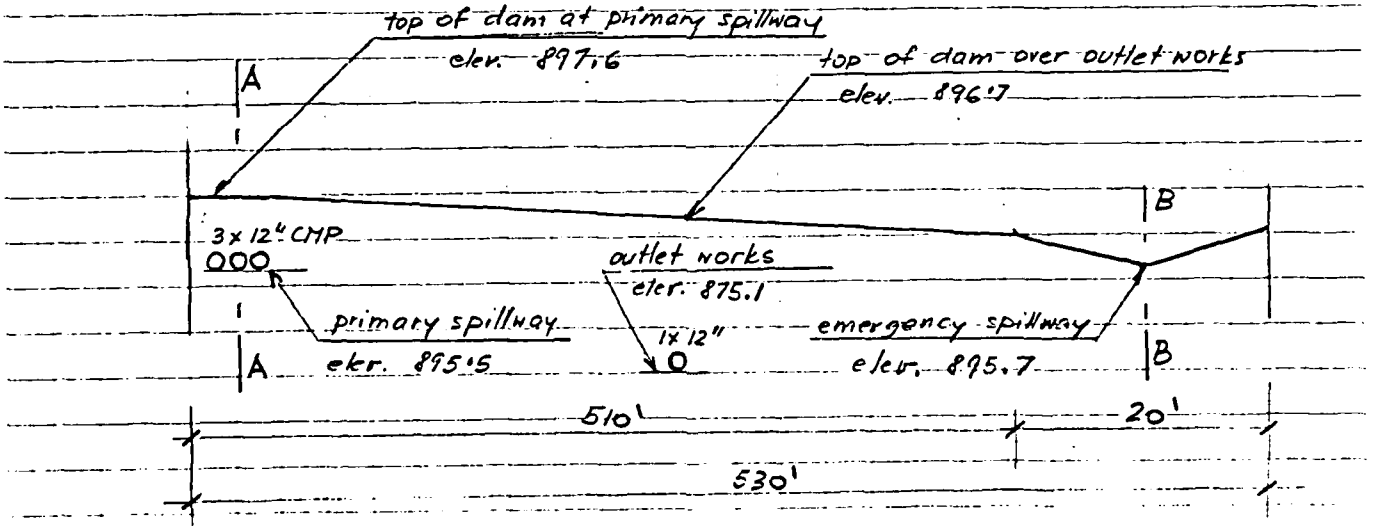
LAKE STORAGE VOLUME :

WATER SURFACE ELEVATION [Ft]	AREA [Acres]
875.0	0
895.0	8.72
920.0	16.07
940.0	36.73

HEC-1-DAM PROGRAM WILL DEVELOP STORAGE CAPACITY FROM SURFACE AREA AND ELEVATIONS INFORMATION TAKEN FROM U.S.G.S. QUADRANGLE, Flatbrookville, New Jersey.

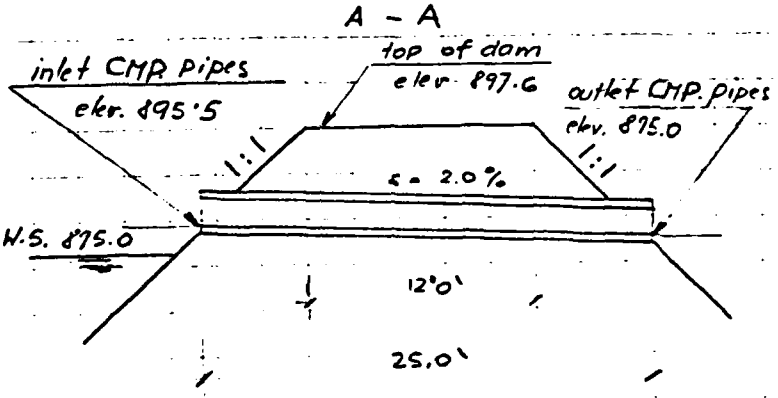
HYDRAULICS

THE PRINCIPAL SPILLWAY AT Noname #36 LAKE DAM CONSISTS OF THREE (3) - 12 inch. DIAMETER CORRUGATED METAL PIPES LOCATED AT THE RIGHT END OF THE DAM. A EMERGENCY GRASS SPILLWAY IS LOCATED AT THE LEFT END OF THE DAM.



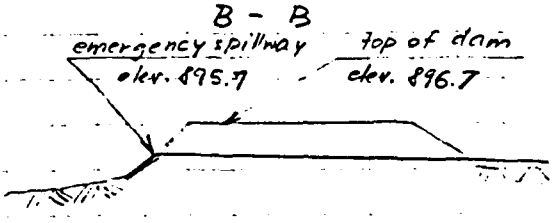
PRIMARY SPILLWAY

A - A



EMERGENCY SPILLWAY

B - B



DISCHARGE:

[Hydraulic charts for the selection of highway culverts Pg 5-25]

PRIMARY SPILLWAY:

Discharge on the primary spillway through three (3)

12" CMP :

inlet elevation	=	895.5	Ft
outlet elevation	=	895.0	Ft
length of pipes	=	25.0	Ft
slope	=	2.0	%
entrance type	=	headwall	

Discharge Q [cfs] from nomograph Pg. 25 for various watersurface elevation (HW) and diametr of pipes (D = 1.0') on scale (1)

EMERGENCY SPILLWAY:

[Handbook of hydraulics Pg 5-46]

Discharge over broad crested grassed weir at elev. 895.7 with a various effective length of crest (max. 20.0')

Discharge formula:

$$Q = C L H^{\frac{3}{2}}$$

Q = discharge on crest [cfs]

C = coefficient of discharge

L = effective length of crest [Ft]

H = total head on spillway [Ft]

SPILLWAY

DISCHARGE TABULATION:

Water elevation [Ft]	Primary spillway elev. 895.5 D = 1.0'				Emergency spillway elev 895.7				ΣQ
	HW [Ft]	HW/D	Q [cfs]	3xQ [cfs]	H [Ft]	L [Ft]	C	Q [cfs]	[cfs]
895.5	0	0	0	0	0	0	0	0	0
896.5	1.0	1.0	2.4	7.2	0.8	16.0	2.67	30.6	37.8
896.7	1.2	1.2	2.8	8.4	1.0	20.0	2.66	53.2	61.6
897.7	2.2	2.2	5.5	16.5	2.0	20.0	2.64	149.3	165.8
898.7	3.2	3.2	7.0	21.0	3.0	20.0	2.64	274.4	295.4
899.7	4.2	4.2	8.5	25.5	4.0	20.0	2.64	422.4	447.9

For overtopping analysis, an effective length of overtopping $L = 510.0$ feet was assumed.

Top of dam Elev. 896.7 feet.

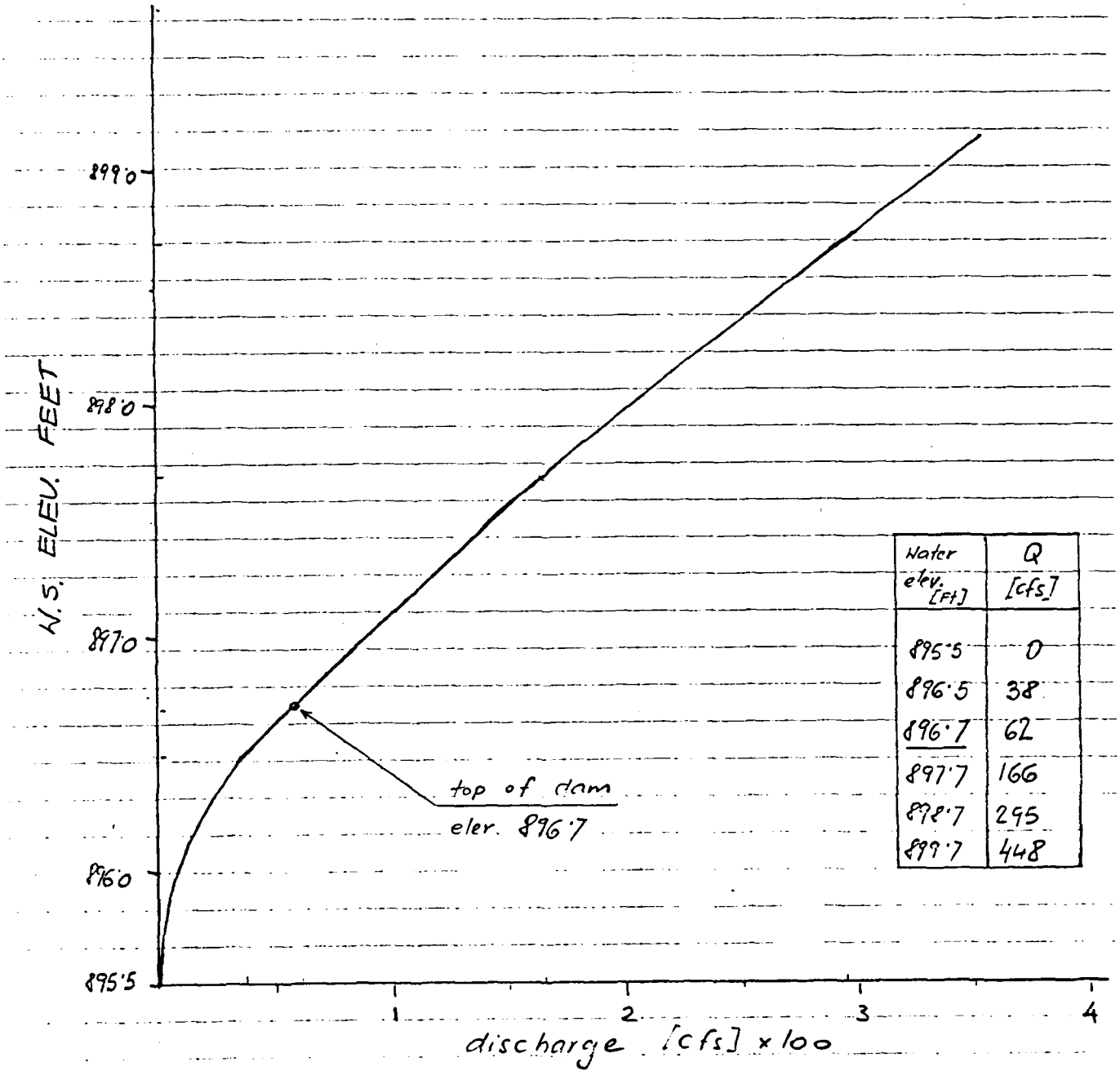
STORCH ENGINEERS

Sheet 9 of 11

Project LAKE N.J. NoNama #36 DAM Made By JiHa Date 3-11-81

Chkd By JG Date 4/10/81

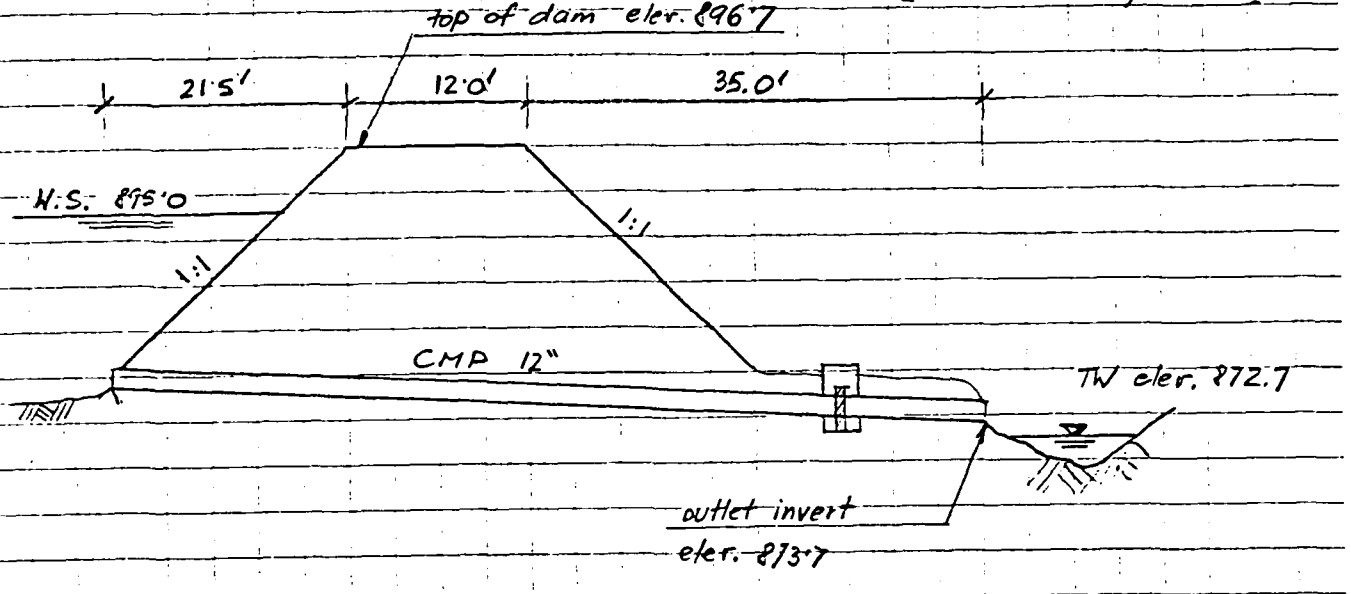
SPILLWAY
STAGE DISCHARGE CURVE



Water elev. [Ft]	Q [cfs]
895.5	0
896.5	38
896.7	62
897.7	166
898.7	295
899.7	448

OUTLET WORKS CAPACITY:

[H-SCHS - Pg. 5-34]



OUTLET WORKS FOR LAKE No Name # 36 DAM CONSISTS OF A CMP CULVERT WITH D = 12" WITH LENGTH OF APPROXIMATLY 70.0 Feet

DISCHARGE FROM "HYDRAULIC CHARTS FOR THE SELECTION OF HIGHWAY CULVERTS" Pg. 34

Nomograph values:

Q average = 7.0 [cfs]

Top of dam - 896.7

TW - 874.7

$\frac{22}{2}$ = 11.0 [Ft]

HW = 11.0 [Ft]

Ke = 0.9

n = 0.024

L = approx 70.0 [Ft]

D = 12" (1')

DRAWDOWN:

OVER OPENED OUTLET WORKS CMP 12"

Q average = 7.0 [cfs]

assume inflow = 0

DRAWDOWN TIME

$$T_d = \frac{\text{storage at spillway [Acft]}}{\text{average discharge [cfs]} - \text{inflow}}$$

$$T_d = \frac{62 \text{ Acft } (43560) \text{ Sqft/Ac}}{7.0 \text{ cfs } (3600) \text{ sec/Hr}} = 107 \text{ Hr. } [4.5 \text{ days}]$$

HEC - 1 - DAM PRINTOUT

Overtopping Analysis

```
1A1                          NATIONAL DAM SAFETY PROGRAM
 A2                          LAKE NONAME #36 DAM, NEW JERSEY
 A3                          100 YEAR STORM ROUTING
 R    150        0       15                                    0       0       4
 R1     5
 J      1        1        1
 J1     1
 K      0     LAKE                          0       0       1
 K1       INFLOW HYDROGRAPH TO LAKE NONAME #36 DAM
 M      0        2    0.15             0.15
 O     96
 O1 0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.019
 O1 0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.019
 O1 0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.019
 O1 0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.019
 O1 0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.019    0.038    0.038
 O1 0.038    0.038    0.038    0.038    0.038    0.038    0.038    0.038    0.038    0.038
 O1 0.083    0.083    0.083    0.083    0.163    0.163    0.163    0.163    0.750    0.750
 O1 0.750    0.750    0.163    0.163    0.163    0.163    0.083    0.083    0.083    0.083
 O1 0.083    0.083    0.083    0.083    0.038    0.038    0.038    0.038    0.038    0.038
 O1 0.038    0.038    0.038    0.038    0.038    0.038
 T                                                          1.5     0.15
 W2             0.6
 X   -1.0    -0.05      2.0
 K      1      DAM
 K1       ROUTE DISCHARGE THROUGH DAM
 Y                                      1        1
 Y1     1                                                -895.5      -1
 Y4 895.5    896.5    896.7    897.7    898.7    899.7
 Y5     0       38       62      166      295      448
 $A     0      8.7     16.0     36.7
 $E 875.0    895.0    920.0    940.0
 $$ 895.5
 $D 896.7     2.49      1.5    510.0
 K      1        1
 K1                          CHANNEL REACH ROUTING 1
 Y                                      1        1
 Y1     1
 Y6  0.08     0.04     0.08      863      869     1200     0.01
 Y7     0      869       40      867       80      866       83      863       91      863
 Y7    97      866      117      867      127      869
 K     99
```

NATIONAL DAM SAFETY PROGRAM
LAKE NONAME #36 DAM, NEW JERSEY
100 YEAR STORM ROUTING

JOB SPECIFICATION

NQ	NHR	NMIN	IDAY	IHR	IMIN	METRC	IPLT	IPRT	NSTAN
150	0	15	0	0	0	0	0	4	0

JOPER	NWT	LROPT	ITRACE
5	0	0	0

MULTI-PLAN ANALYSES TO BE PERFORMED
NPLAN= 1 NRTIO= 1 LRTIO= 1

RTIOS= 1.00

********** ********** ********** ********** **********

SUB-AREA RUNOFF COMPUTATION

INFLOW HYDROGRAPH TO LAKE NONAME #36 DAM

ISTAQ	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
LAKE	0	0	0	0	0	1	0	0

HYDROGRAPH DATA

IHYDG	IUHG	TAREA	SNAP	TRSDA	TRSPC	RATIO	ISNOW	ISAME	LOCAL
0	2	.15	0.00	.15	0.00	0.000	0	0	0

LOSS DATA

LROPT	STRKR	DLTKR	RTIOL	ERAIN	STRKS	RTIOK	STRTL	CNSTL	ALSMX	RTIMP
0	0.00	0.00	1.00	0.00	0.00	1.00	1.50	.15	0.00	0.00

UNIT HYDROGRAPH DATA
TC= 0.00 LAG= .60

RECESSION DATA
STRTQ= -1.00 QRCSN= -.05 RTIOR= 2.00

0
END-OF-PERIOD FLOW

MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q	MO.DA	HR.MN	PERIOD	RAIN	EXCS	LOSS	COMP Q
									SUM	7.12	4.33	2.79	1813.
										(181.)	(110.)	(71.)	(51.34)

********** ********** ********** ********** **********

HYDROGRAPH ROUTING

ROUTE DISCHARGE THROUGH DAM

ISTAO	ICOMP	IECON	ITAPE	JPLT	JPRT	INAME	ISTAGE	IAUTO
DAM	1	0	0	0	0	0	0	0

ROUTING DATA

QLOSS	CLOSS	AVG	IRES	ISAME	IOPT	IPMP	LSTR
0.0	0.000	0.00	1	1	0	0	0

NSTPS	NSTDL	LAG	AMSKK	X	TSK	STORA	ISPRAT
1	0	0	0.000	0.000	0.000	-896.	-1

STAGE	895.50	896.50	896.70	897.70	898.70	899.70
FLOW	0.00	38.00	62.00	166.00	295.00	448.00
SURFACE AREA=	0.	9.	16.	37.		
CAPACITY=	0.	58.	362.	875.		
ELEVATION=	875.	895.	920.	940.		

CREL	SPWID	COQW	EXPW	ELEVL	COQL	CAREA	EXPL
895.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0

DAM DATA

TOPEL	COQD	EXPD	DAMWID
896.7	2.5	1.5	510.

PEAK OUTFLOW IS 211. AT TIME 18.50 HOURS

PEAK FLOW AND STORAGE (END OF PERIOD) SUMMARY FOR MULTIPLE PLAN-RATIO ECONOMIC COMPUTATIONS
FLOWS IN CUBIC FEET PER SECOND (CUBIC METERS PER SECOND)
AREA IN SQUARE MILES (SQUARE KILOMETERS)

OPERATION	STATION	AREA	PLAN	RATIOS APPLIED TO FLOWS RATIO 1 1.00
HYDROGRAPH AT	LAKE	.15 (.39)	1	226. (6.41)(
ROUTED TO	DAM	.15 (.39)	1	211. (5.98)(
ROUTED TO	1	.15 (.39)	1	207. (5.87)(

1 SUMMARY OF DAM SAFETY ANALYSIS

PLAN 1 .....

	INITIAL VALUE	SPILLWAY CREST	TOP OF DAM
ELEVATION	895.50	895.50	896.70
STORAGE	62.	62.	73.
OUTFLOW	0.	0.	62.

RATIO OF PMF	MAXIMUM RESERVOIR W.S.ELEV	MAXIMUM DEPTH OVER DAM	MAXIMUM STORAGE AC-FT	MAXIMUM OUTFLOW CFS	DURATION OVER TOP HOURS	TIME OF MAX OUTFLOW HOURS	TIME OF FAILURE HOURS
1.00	896.92	.22	75.	211.	1.50	18.50	0.00

PLAN 1 STATION 1

RATIO	MAXIMUM FLOW,CFS	MAXIMUM STAGE,FT	TIME HOURS
1.00	207.	865.9	18.50

APPENDIX 5

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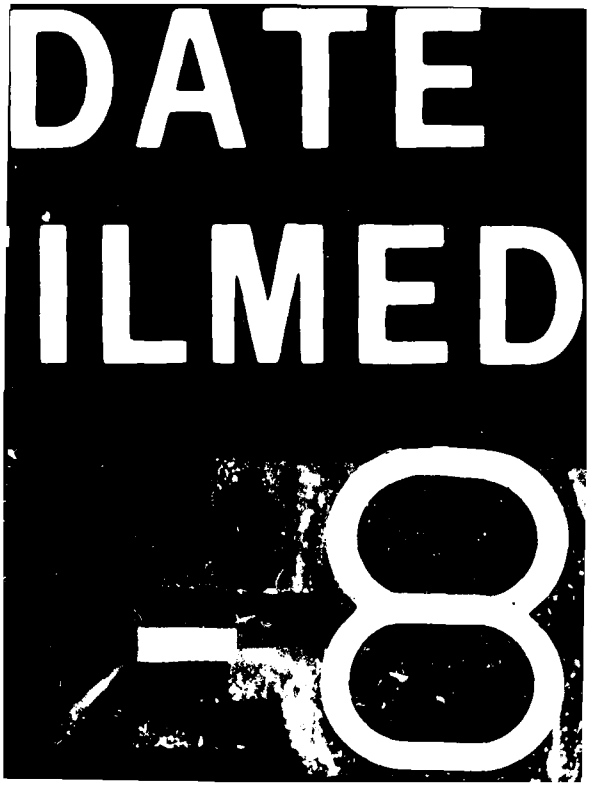
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